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MEMORANDUM FOR : Deputy Director (Plans)  
THROUGH : Acting Chief, DPD-DD/P <sup>520</sup>  
SUBJECT : Aviation Week Mach 4 Airplane

1. The attached article appeared in the 22 August 1960 issue of Aviation Week. The author here has invented a special purpose reconnaissance aircraft which is, in fact, quite close to the XC-47 aircraft.

2. I have evaluated the estimates given in the article and they are reasonably correct within the limitations of the usual optimism factor. Aviation Week, of course, will never be called upon to actually design and build an aircraft. The magazine uses statute rather than nautical mile terminology.

3. The gist of this idea is the use of a compound power plant installation consisting of a Bristol Siddeley ducted fan turbojet for takeoff, climb and initial acceleration, and a ramjet installation for high speed cruise. Although the particular ramjet cited by the author would not be capable of the performance claimed, the Marguerdt ramjet, designed for the Convair Fish aircraft, would work out quite well.

4. The one feature which would be extremely difficult, if not impossible, to perfect for our application is the engine inlet. The author proposes an installation with air taken aboard in scoops sufficiently variable in geometry such that the various engine demands can be met. These demands are:

- a. Something in the neighborhood of 200 lbs. of air per second for the turbojet during takeoff and initial climb.
- b. Approximately 500 lbs. per second during acceleration to satisfy both turbojet and ramjet.
- c. 300 lbs. per second each for four (4) ramjets during initial cruise and a similar unit quantity for two (2) ramjets at end of cruise.

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5. Probably with some years of incubation in our better supersonic wind tunnels, such inlets could be constructed aerodynamically and structurally. However, I doubt very much if we could ever achieve suitable aerodynamic performance in the inlet coupled with satisfaction of the demands levied by the Rodgers effect.

6. The weight budget as given by Aviation Week is fairly reasonable, except that the allotment to power plant is somewhat thin. The lift drag ratio is somewhat optimistic and, of course, makes no concession in the direction of AR performance.

7. [REDACTED] will attend the annual Farnborough Air Show next week. His specific job is to determine personally, the development status and greater technical information on the Bristol fan turbojet and other engines by Rolls Royce and others.

[REDACTED]  
Chief, Technical Analysis Staff  
DPD-DD/P

Attachments:

Article from 22 Aug 60  
Aviation Week

CH/TAS/DPD/EPK:rew(7 Sept 60)

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